SUBJECT TEACHING GUIDE

G119 - Mathematics for Secondary Education

Double Degree in Physics and Mathematics
Degree in Mathematics

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	Double Degree in Physics and Mathematics Degree in Mathematics			Type and Year	Optional. Year 5 Optional. Year 4
Faculty	Faculty of Sciences				
Discipline	Subject Area: Mathematics for Secondary Education Mention in Pure and Applied Mathematics				
Course unit title and code	G119 - Mathematics for Secondary Education				
Number of ECTS credits allocated	6	Term		Semester based (2)	
Web	https://moodle.unican.es/course/view.php?id=3659				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICAS, ESTADISTICA Y COMPUTACION
Name of lecturer	RAUL FERNANDEZ COBOS
E-mail	raul.fernandezcobos@unican.es
Office	Facultad de Ciencias. Planta: + 0. DESPACHO PROFESORES (0055)
Other lecturers	JOSE MANUEL DIEGO MANTECON

3.1 LEARNING OUTCOMES
Connecting the mathematical contents of Secondary Education with the phenomena that originate them, recognizing the formal aspects involved together with its presence in everyday situations and those others that come from multidisciplinary fields (Physics, Biology, Economics, etc.).
Recognizing the types of students' reasoning, proposing tasks that guide them, diagnosing their errors, and proposing the corresponding processes of intervention.
Selecting and sequencing activities for school learning; analyzing the various problems that arise in learning situations
Having specific criteria, techniques, and instruments for the evaluation of mathematical knowledge.
Knowing resources and materials (computational, audiovisual, manuals, bibliographical, etc.) and using them properly in the teaching of Mathematics in Secondary Education.

4. OBJECTIVES
Presenting idiosyncratic aspects of school mathematics and the problems derived from its teaching, complementing the formal vision that students have of it.
Developing student professional skills related to the design of teaching mathematical content for Secondary Education
Developing student commitment to training, and a critical and reflective attitudes towards Mathematics Education.

6. COURSE ORGANIZATION	
CONTENTS	
1	Block 1: Introduction to Secondary Education, teaching planning and cultural perspective of mathematics teaching
2	Block 2: Learning mathematics: problem-solving strategies, errors and difficulties
3	Block 3: Learning approaches and resources

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessment	%
Assessment activity related to blocks 1 and 2 (50%)	Work	Yes	Yes	50,00
Assessment activity related to block 2 (25%)	Work	Yes	Yes	25,00
Assessment activity related to block 3 (25%)	Work	Yes	Yes	25,00
TOTAL				100,00

Observations
- Class participation will be valued. - The final mark for the subject will be the weighted average of the individual grades of each of the three assessment activities. Calculating the average mark will require a minimum of 4 points out of 10 in the assessment activity related to blocks 1 and 2. -The assessment activity related to blocks 1 and 2 will be defended through an oral presentation. - In the extraordinary call, all subject contents will be evaluated by means of a 'Final Exam'.
Observations for part-time students
For students enrolled under the part-time modality, the final mark will be the one obtained in the 'final exam'.

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC

- Boyer, C. B. (1986). Historia de la matemática. Alianza Universidad Textos.

- Diego-Mantecón, J. M., Haro, E., Blanco, T. F., & Romo-Vázquez, A. (2021). The chimera of the competency-based approach to teaching mathematics: a study of carpentry purchases for home projects. Educational Studies in Mathematics, 107(2), 339-357.

- Diego-Mantecón, J. M., Ortiz-Laso, Z., & Blanco, T. F. (2022). Reflexiones del Open STEAM Group sobre el Impacto Integrado del Contenido en el Aprendizaje de las Matemáticas. In T. F. Blanco, C. Núñez-García, M. C. Cañadas, & J. A. González-Calero (Eds.), Investigación en Educación Matemática XXV (pp. 81-94). SEIEM.

- Fauvel, J. y van Maanen, J. A. (2000). History in mathematics education: An ICMI study. The Netherlands: Kluwer Academic Publishers.

- Isturiz, M. P., Diego-Mantecón, J. M., Polo-Blanco, I., & González-López, M. J. (2019). Causas de los errores en la resolución de ecuaciones lineales con una incógnita. PNA, 13(2), 84-103. http://doi.org/10.30827/pna.v13i2.7613

- Kilpatrick, J., Rico, L. y Sierra, M. (1994). Educación Matemática e Investigación. Madrid: Editorial Síntesis.

- Ortiz-Laso, Z., & Diego-Mantecón, J.M. (2020). Strategies of Pre-Service Early Childhood Teachers for Solving Multi-Digit Division Problems. Sustainability, 12(23), 10217. https://doi.org/10.3390/su122310217

- Rico, L. y Moreno, A. (Eds.) (2016). Elementos de didáctica de la matemática para el profesor de Secundaria. Madrid: Pirámide.

-Rico, L. (Ed.) (1997). La Educación Matemática en la Enseñanza Secundaria. Barcelona: Editorial Horsori.

- Vinner, S. (1991). The role of definitions in the teaching and learning of mathematics. In D. Tall (Ed.) Advanced mathematical thinking (pp.65-80).Dordrecht: Kluwer Academic Press.